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THE RELATIONSHIP AMONG SELECTED MEASURES OF PHYSICAL
FITNESS, BODY-IMAGE, SELF-CONCEPT, MOVEMENT-CONCEPT,
AND SELECTED PERSONALITY TRAITS OF COLLEGE PHYSICAL
EDUCATION MAJORS WITH LOW PHYSICAL FITNESS INDICES

by

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6567

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The purpose of this study was to improve the originally low level of physical fitness of twelve women majoring in physical education at the University of North Carolina at Greensboro, and to investigate the effects of this change on selected personality variables.

Another purpose was to determine possible inter-relationships between the physical fitness and personality variables prior to the conditioning program. The following eleven variables were used: (1) Physical Fitness (2) Abdominal Strength (3) Physical Endurance (4) Arm and Shoulder Strength, plus three Q-Sort items of (5) Body-Image (6) Self-Concept (7) Movement-Concept, and four items from the Edwards Personal Preference Schedule which were (8) Achievement (9) Autonomy (10) Succorance, and (11) Personality Endurance.

The Iowa Physical Fitness Test was used to measure the first four physical fitness variables. A Q-Sort technique, as developed by Doudlah was used to measure Body-Image, Self-Concept, and Movement-Concept. The Edwards Personal Preference Schedule was used to measure the remaining four personality variables. The XBX exercise series developed by the Royal Canadian Air Force was used for the purpose of increasing the level of physical fitness of the subjects in this study.

The subjects included six freshmen, two sophomores, and four juniors who scored below a T-score of fifty on the Iowa Physical Fitness Test. At the beginning of the study, the subjects were administered the two personality tests

(Q-Sort and EPPS). Following this, they began a thirty day conditioning program to improve their level of physical fitness. At the end of the conditioning period, the twelve subjects were readministered the Iowa Physical Fitness Test to determine if their level of fitness had increased. They were also readministered the two personality tests.

The data gathered was treated in two ways. The differences were found between the beginning and end scores for the eleven physical fitness and personality variables. Also, correlations between the eleven variables prior to the conditioning program were calculated.

Only two variables indicated a statistically significant relationship prior to the conditioning program. These items were Abdominal Strength and Achievement. This relationship was significant at the five per cent level of confidence.

The greatest differences before and after the conditioning program occurred in the areas of Physical Fitness, Abdominal Strength, and Body-Image. The differences for these three items were all significant at the one per cent level of confidence. Achievement was found to be significantly different at the five per cent level of confidence.

The following conclusions may be drawn from this study:

1. A thirty day conditioning program using the XBX exercise series significantly increased the level of physical fitness of the twelve subjects involved in this study - particularly Abdominal Strength, as measured by the Iowa Physical Fitness Test.

2. Abdominal Strength as measured by the Iowa Physical Fitness Test was significantly related to Achievement as defined and measured by the Edwards Personal Preference Schedule.
3. Increased physical fitness resulted in a more secure Body-Image and higher Achievement scores as measured by Doudlah's Q-Sort and the Edwards Personal Preference Schedule.

The definitely improved level of physical fitness and the internal consistency of results for the personality variables used in this study, seem to indicate that the measuring instruments are satisfactory for further exploration into the areas of physical fitness and personality.

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CHAPTER I

INTRODUCTION

The interaction between man's physical body and his emotions is becoming increasingly apparent as investigators unearth more and more knowledge in the areas of human behavior, biology, physiology, and other related sciences. Indeed, one can question the existence of any partition at all, saying that every thought, feeling, and action must have a physical or chemical origin before it can even occur.

We know that physical illness can be a result of psychic stress, and we know that strong psychic motivation can cause one to accomplish feats which would otherwise seem to be impossible - be it a matter of elimination of psychic inhibition, or the creation of greater psychic incentive. The result is the same, and the process involves some kind of psychosomatic interplay.

The far-reaching implications of this interplay of mind and body are too vast and intricate to even imagine at the present time, and whether we will acknowledge our prejudice or not, it is almost a part of our natural heritage to think in dualistic terms. Our greatest philosophers have laid a foundation for this sort of reasoning. Plato saw the soul as a temporary prisoner of the body on a pilgrimage toward its natural habitat - the world of Ideas. And our whole Western culture is permeated with the Christian concept which would make man's

soul immortal, but his body only a temporary dwelling place. Such a viewpoint elevates the mind and gives lesser importance to physical things. But if a true adhesion exists, man is truly "heaven and earth in little".

Since this totality seems to be more and more evident, there must be at least two ways of approaching man. The mind must be accessible through the body, and the mind must also be an avenue to the body. If this is true, the importance of physical fitness cannot be minimized concerning its effect on personality and attitude. Nor can the reverse be ignored. Harold Wells⁽⁴⁴⁾ has suggested the possibility of subtle dangers for a nation of people low in physical fitness. The whole psychic organism could be affected.

Thus physical fitness may mean more than the term implies. This study attempts to probe some of the possible inter-relationships between personality, attitudes, and physical fitness. The evidence gained in this study will only be a tiny flicker in the light of what we need to know in this area.

Truly, mind and body seem to be one. "How" this is so, remains somewhat of a blurr which will gain focus with each effort made toward a better understanding of this complex relationship.

CHAPTER II

STATEMENT OF PROBLEM AND DEFINITION OF TERMS

I. STATEMENT OF PROBLEM

The purpose of this study was to improve the originally low level of physical fitness of twelve subjects, college women majoring in physical education at the University of North Carolina at Greensboro, and to investigate the effects of this change on selected personality variables.

Another purpose was to determine possible inter-relationships between the physical fitness and personality variables prior to the conditioning program. The following eleven variables were used: (1) Physical Fitness (2) Abdominal Strength (3) Physical Endurance (4) Arm and Shoulder Strength, plus three Q-Sort items of (5) Body-Image (6) Self-Concept (7) Movement-Concept, and four items from the Edwards Personal Preference Schedule which were (8) Achievement (9) Autonomy (10) Succorance, and (11) Personality Endurance.

II. DEFINITION OF TERMS

The following definitions were used in this study:

Physical Fitness: The score earned on the Iowa Physical Fitness Test.

Abdominal Strength: The total number of sit-ups done during one minute.

Physical Endurance: The total number of up and down movements performed during one minute of chair stepping.

Arm and Shoulder Strength: Push and pull performance measured by a dynamometer.

Body-Image: The mental picture the individual has of her physical body.

Self-Concept: How the individual perceives herself in all facets of life.

Movement-Concept: That view an individual has of herself as a physically mobile entity.

Achievement: (As defined in the Edwards Personal Preference Schedule)
To do one's best, to be successful, to accomplish tasks requiring skill and effort, to be a recognized authority, to accomplish something of great significance, to do a difficult job well, to solve difficult problems and puzzles, to be able to do things better than others, to write a great novel or play.

Autonomy: (As defined in the Edwards Personal Preference Schedule)
To be able to come and go as desired, to say what one thinks, to be independent of others in making decisions, to feel free to do what one wants, to do things that are unconventional, to avoid situations where one is expected to conform, to do things without regard to what others may think, to criticize those in positions of authority, to avoid responsibilities and obligations.

Succorance: (As defined in the Edwards Personal Preference Schedule)
To have others provide help when in trouble, to seek encouragement from others, to have others be kindly, to have others be sympathetic and understanding about

personal problems, to receive a great deal of affection from others, to have others do favors cheerfully, to be helped by others when depressed, to have others feel sorry when one is sick, to have a fuss made over one when hurt.

Personality Endurance: (As defined in the Edwards Personal Preference Schedule) To keep at a job until it is finished, to complete any job undertaken, to work hard at a task, to keep at a puzzle or problem until it is solved, to work at a single job before taking on others, to stay up late working in order to get a job done, to put in long hours of work without distraction, to stick at a problem even though it may seem as if no progress is being made, to avoid being interrupted while at work.

Self-Sort: How the individual perceives himself at the present time.

Ideal-Sort: How the individual would ideally like to be.

Secure Image: Occurs when the self-sort and ideal-sort tend to coincide.

CHAPTER III

REVIEW OF LITERATURE

There has been a considerable amount of work done in the area of investigating physical performance as related to personality. These studies have encompassed many disciplines all the way from psychology to physiology and even in the field of literature one can find many subjective accounts. Despite these explorations, there is still relatively little more than a puncture into the vast amount of knowledge left to explore. In this chapter, the investigator has attempted to deal with the three basic aspects of this study separately, although there is bound to be a natural overlapping in many cases. The categories of Body-Image, Self-Concept, and Movement-Concept, have all been considered together because of their many similar implications. This category is preceded by a discussion of physical fitness, and then personality.

I. PHYSICAL FITNESS

It is said that Europe is more fit than America and India more spiritual than the United States. There is little virtue in fitness without labor saving devices, in spirituality without temptation of diversion. America must learn fitness in plenty, strength with automobiles, and spiritual discipline with TV to distract, and ease to deter. For it is easier for a camel to enter through the eye of a needle than for a nation of affluence to enter the kingdom of fitness - physical, mental, and spiritual. (9:320)

The headlines blared that our children were not as fit as the Europeans. The

president appointed a special council on fitness, and suddenly the fanfare began to get the nation back "in shape".

It is interesting to note the emphasis on fitness whenever war is eminent. This has been so since the earliest civilizations and it is still true today. Even the convention themes for the American Association for Health, Physical Education, and Recreation reflect this trend. In 1916 the theme was "Preparedness Through Physical Education". In 1942 the theme was "National Fitness Through Health, Physical Education and Recreation". The theme for 1943 was "Victory Through Fitness", in 1944 "Fitness for Today and Tomorrow", and in 1946 "Fitness for the American Way of life". The present emphasis could be alarming from this point-of-view.

As Steinhaus says, fitness is a "many splendored thing" and includes the whole spectrum from mental to physical fitness. Gallagher and Brouha as cited by Skubic and Hodgkins stated that "there are at least three primary aspects of physical fitness: a) medical or static fitness having to do with the soundness of organs of the body; b) functional or dynamic fitness which has to do with functional status, the ability to do strenuous work, and physiological efficiency; and c) the type of fitness which has to do with specific skills, muscle coordinations, and strength". (21:191) These categories are overlapping and related in many respects, but can also be measured and considered separately. This study was primarily concerned with Gallagher and Brouha's third category of physical fitness which is commonly termed "motor fitness". But even this category can be further sub-divided. Brock, Cox, and Pennock as cited by

Wells, stated that

Motor fitness is a complex. A number of factors enter into efficient performance whether it be mainly of strength, speed, endurance, or skill. There is not one thing alone but the body type or structure, the chemistry, the mechanics, the organic functioning, and the emotional state, can all be considered as composing the elements that make for fitness in motor or skill performance. It is a Gestalt, resulting in the control of all the factors of strength and speed and endurance by complex psychic factors. It is the whole personality dynamically organized that results in motor fitness. (44:3)

One purpose of this study was to increase the level of physical fitness of the subjects involved. Consequently they participated in a thirty day conditioning program. As a result of this, certain physiological changes should have occurred in these subjects; however, these changes were not measured except by the demonstration of a higher level of motor fitness on the Iowa Physical Fitness Test. The conditioning program used was not severe enough to be considered a real training schedule, but some of the same effects probably occurred to a lesser degree. (Skubic and Hodgkins⁽²¹⁾ noted that girls who have trained for at least three hours per day, six days per week for seven months are considered trained and in an excellent state of cardiovascular fitness.) Some of the physiological changes produced by training and exercise include the following: (6:403)

1. Increased strength of the muscles and improved neuromuscular coordination.
2. Greater mechanical efficiency as measured in terms of lower oxygen consumption for a given amount of work.
3. Greater maximum oxygen consumption.
4. A higher maximum cardiac output with less increase in pulse rate

and blood pressure during submaximal exercise.

5. More economical ventilation during exertion, and a greater maximum pulmonary ventilation.
6. Lower blood lactate for a given amount of exercise, i.e. capacity to perform more work aerobically; and ability to push self to a higher blood lactate before exhaustion, i.e. capacity to perform more work anaerobically.
7. Quicker recovery in pulse rate and blood pressure after submaximal exercise.
8. Better heat dissipation during submaximal exertion.

Cureton noted that

in the trained state, the nervous system is trained for action rather than inaction In other words, persistent physical training negates some of the poorly rated parasympathetic nervous tendencies, and if not carried too far into over-training, develops positive, dynamic qualities of psychological value. With such training there is more and more resistance to fatigue associated with poor circulation in either the static or the dynamic state. Vasoconstriction and anxiety are better resisted at least. (13:177)

Physical fitness testing has gained considerable momentum since 1900, and in the past thirty years many tests have been devised for men particularly. Cureton, as cited by Wells, stated that the three principle approaches for objective testing of physical fitness are appraisal of "physique, organic efficiency, and motor fitness". (44:10) A major problem in the assessment of motor fitness is the one of motivation. In present tests, this "will-to-do" may be an exclusive determinant of fitness as scored by present techniques. Brouha(6:398) stated that an officer who has worked with and knows his men is often better able to

evaluate their fitness than any fitness test yet devised. Cureton stated that "it has long been only too obvious to us that for many so-called 'fitness tests' there are psychological interpretations as well as physiological interpretations. In fact, the fitness work is to us always psychological-physiological and anatomical." (13:177)

Studies Related to Physical Fitness

Michael and Gallon⁽¹⁹⁾ in their study of periodic changes in circulation during athletic training found that after three to six weeks of hard physical conditioning with the step test, a plateau or leveling-off period was reached. The authors stated that this plateau pattern could be due either to the psychological drive span or a true physiological cycle.

Strong⁽²³⁾ in his study on motivation as related to performance of physical fitness tests found that motivation is definitely a significant factor in increasing performance. He also found that the level of aspiration and team competition motivating conditions are more effective than competition against self, competition to establish class records, competition against someone of nearly equal ability, and competition against someone of markedly different ability. Strong also noted that motivation improves boys' performances more than girls' performances. He concluded that the validity of the measures of physical fitness tests is dependent upon the motivating conditions under which the tests are administered.

Wireman⁽²⁴⁾ compared four approaches to increasing physical fitness.

His groups consisted of freshmen male college students divided into the following four categories: a) calisthenics, games, and sports with a periodic knowledge of results; b) calisthenics, games, and sports without a knowledge of results; c) games and sports with a periodic knowledge of results; and d) games and sports without a knowledge of results. Findings from this study showed that knowledge of results seemed to have more effect on physical fitness than fifteen minutes of calisthenics at the beginning of each class.

II. PERSONALITY

In this section, an attempt will be made to discuss briefly a few theories of personality. Following this brief review, some studies related to personality and physical performance will be discussed.

This study was based on a dynamic view of personality. Johnson has noted that "most current theories agree in viewing personality as an organization of enduring and characteristic ways of perceiving, feeling, and acting which have been the result of responses to motives". (6:527-8) And, even in a dynamic view, personality is regarded as a stable product of the interactions of the motivated individual with his environment. In this context, personality is a highly developed means by which motivations impell an individual in his dealings with his social environment and his intrapersonal relations. Such a conception makes motivation the primary concept, and personality an expression of motivations. Thus by reading the expressions of personality, we may be able to understand the underlying motivations and this becomes a dynamic view of personality.

A static concept of personality would "simply attempt to describe the individual in terms which would indicate his major characteristics and raise no questions concerning the origins of these traits in motivational terms". (6:528)

As a passing observation, it may be noted that constitutional theories of personality and motivation do not play a significant role in the current scene. This is not to say that hereditary processes are denied, for this would not be possible. It is only to say that constitutional theories such as those of Sheldon, do not occupy a prominent position in literature today.

Essentially, there are four main theories of personality motivation represented by Freud, Hull, Hebb, and Maslow. (6:527) In the older instinct theories such as that formulated by William McDougall, the instinct was seen as the prime determinant of conduct, and behavior moved toward the attainment of those goals necessary to instinct satisfaction. (6:528-9) There are certain similarities between McDougall, Freud, and Murray in this emphasis on the directive function of the motive. From this point of view, motivation becomes the central concept with a purposeful function. Freud suggested the basic instinctual forces - those having to do with the Eros or life processes as exemplified by the sexual instinct, and those having to do with death, aggression, and destruction. The death instinct was rejected by many authorities, and Freud himself said it was seldom seen in pure form, but usually appeared as fusions with some aspect of Eros as in sadism and masochism. Freud also had the sexual instinct passing through several stages before reaching maturity (oral, anal, and phallic periods). Remaining too long in either of the first two periods

could lead to a fixation and resulting personality problems. According to Freud, the Id is the force that desires to pleasantly satisfy the basic instinct of the Eros. The Ego becomes the control center to check the demands of the Id, and the Super-Ego rules supreme as the authoritarian image of parents etc. The Ego has to keep peace and unity between the Id and the Super-Ego, a difficult task that often leads to guilt and defense mechanisms in the Ego such as repression, protection, reaction formation, identification, and sublimation. Freud attached a great deal of importance to play as a means of discharging aggression and hostility. He dealt primarily with neurotics, consequently his theories are not always convincing for the so called normal or average person. (6:532)

Another theory considers motivation as a coordinate concept with energizing and rewarding functions. In this context, motivation does not steer or direct; it only activates or sensitizes the learned or innate structures which give direction. Thus motivation according to this theory is like gasoline - it supplies the energy, but it is not the motor or steering mechanism.

A third theory considers motivation to be present as a movement toward the satisfaction of natural curiosity, the desire to receive stimulation, and to manipulate. According to this theory, organisms experience acute discomfort and show intellectual disturbances when there is no external stimulation, problem to solve, or sensory stimuli available. This theory is relatively new and remains to be explored further.

The fourth theory places emphasis on motivation for self-actualization.

Fundamentally, this point-of-view says that man must be free to express himself and fulfill his potentialities. Anxiety and unsatisfied needs which force the individual to artificially conform would be the opponents to self-actualization. Maslow's hierarchy of basic human needs would fall into this category of personality theory.

According to the stress theory of Selye⁽⁸⁾, organisms attempt to maintain their homeostatic balance, and upset of this balance causes stress for the organism. However, Selye would be quick to say that stress is also necessary for healthy functioning of the organism because meeting it well constitutes life itself. The problem lies in interpreting and meeting it wisely.

Despite the personality theory one subscribes to, any man is essentially governed by his individual frame of reference which has been conditioned by his social environment, tempered by his psychic disposition and limited by his biological potential.⁽⁴²⁾

Many techniques and procedures have been devised during the past few years for the measurement of personality and motivational characteristics. Two fundamental problems exist in this area of assessment, and these are, to create instruments which are both reliable and valid. This problem is particularly difficult in the measurement of personality. A few of the devices used include questionnaires, ratings, and unstructured projective procedures such as the Rorschach Test and the drawing of pictures.

"Although there is a growing research literature dealing with the personality traits of various types of athletes, studies have not been done which

justify generalization as to specific identifying characteristics of groups". (6:546)

Studies Related to Personality Variables

Perhaps the study most related to this present investigation is the one done by Harris⁽³⁰⁾ on the comparison of physical performance and psychological traits of college women with high and low fitness indices. To measure the level of physical fitness, the three-item Scott Fitness Battery was used which includes the push-pull, sit-ups, and chair-stepping. The Kraus-Weber Test, and the Wells-Dillon Sit-Reach Test were also used in the preliminary stages of the study to help differentiate a high and low group. The subjects consisted of seventy-nine physical education major students. The psychological traits were measured by scores on the Taylor Manifest Anxiety Scale and the Edwards Personal Preference Schedule. Results of this study showed that the two groups differed significantly with respect to physical performance. Analysis of scores on Taylor's Manifest Anxiety Scale yielded no statistically significant difference between the groups, although the lower fitness group appeared slightly more anxious. Several Edwards Personal Preference Schedule variables indicated a significant difference. The upper group obtained higher scores on Endurance, and a slightly higher score for Intraception. Other variables approaching significant differences were Abasement, and Nurturance with the lower group yielding higher scores. The upper group showed a higher mean on Exhibition, and the lower group had a higher mean on Deference, Succorance, Heterosexuality, and Change. No statistically significant difference was observed for

Achievement, Order, Autonomy, Dominance, or Aggression. From the findings of this study, Harris assumed that little relationship existed between the state of fitness and the personality traits of an individual as measured in this study.

Thorpe⁽⁴¹⁾ conducted a study of personality variables among successful women students and teachers of physical education. As a measuring instrument of personality, the investigator used the Edwards Personal Preference Schedule. Conclusions drawn from this study indicated that successful women in physical education tended to score significantly higher than the normative group in the following personality variables: Deference, Order, Dominance, and ENDURANCE - where the greatest difference occurred. The subjects scored significantly lower on the Autonomy, Succorance, Nurturance, Heterosexuality, and Aggression variables of the Edwards Personal Preference Schedule. It was also concluded that there tended to be an existing pattern of similarity of personality variables among the 255 successful women teachers, graduate students, and senior major students in physical education who participated in this study.

Rogers⁽³⁸⁾ did a comparison of personality variables of college women physical education majors who were successful in student teaching with those who were not. She based her study on the one done by Thorpe⁽⁴¹⁾. The Edwards Personal Preference Schedule was used to measure the personality variables. Results of this study showed little difference between the two student teacher groups when compared with each other or between the student teacher groups and the senior physical education major student group in the Thorpe study. When the physical education major students were compared with the normative groups

of college women, the physical education majors scored significantly higher on Change, Endurance, and Deference. They scored significantly lower on Intraception and Succorance. When compared with the in-service group of teachers, the student teachers tended to score significantly higher on Autonomy, Change, and Heterosexuality. They scored significantly lower on Deference, Order, Intraception, and Dominance. All of the combined physical education groups had higher means than the normative group on the following variables: Achievement, Deference, and Endurance. They had lower means on Succorance and Nurturance. The conclusions drawn from this study further support the conclusions from Thorpe's study⁽⁴¹⁾. There does seem to be a similarity of personality traits of persons who chose physical education as a profession.

Wells⁽⁴⁴⁾ did a very fine study on the relationships between physical fitness and psychological variables. His measures included thirty-eight physical fitness variables, and thirty-five psychological variables. From a total of 1330 correlations, 116 were found to be significant. Results of this study showed that there were significant relationships between physical fitness variables and psychological variables, as demonstrated by measurement on this sample of eighty men. Dynamic strength as measured by number of dips correlated significantly with six psychological variables. More dynamic strength related negatively to personality traits described as emotional, tense, and withdrawn. Individuals who showed more power on the C-VJ-D (Chins, Vertical Jumps, Dips) test tended to be less anxious, less emotional, more poised and less unsure. A high pulse rate related to more overall anxiety and traits of

being less sensitive and more critical. Heartometer measurements reflected direct relationships with three to six psychological variables. The theory that personality is related to physique was supported when body measurement variables, such as muscular index, biceps girth, and shoulder width related significantly to many personality traits. Those subjects having a larger biceps girth were more adventurous and showed less overall anxiety. Greater total strength seemed to indicate more critical exactness and less non-conformity. Those scoring high on the Larson's C-VJ-D test were more calm and showed less anxiety and tenseness. A higher score on Cureton's eighteen item test was related to more neural reserves, and less anxiety. Better treadmill running time seemed to be related to more passivity and less tenseness.

Adams⁽²⁵⁾ studied the effects of physical conditioning upon physiological stress response and psychological adjustment. His subjects included twenty-eight male students, and his measures were the Brouha 5-minute step test, the cold pressor test, and the Minnesota Multiphasic Personality Inventory. The experimental group practiced an endurance running program for seven weeks. The control groups did not change significantly on any test. The experimental group adjusted more readily to the physical stress of the step test, and had significantly lower pulse rates and return to basal pulse rate in three minutes after exercise. The experimental group appeared more secure, self-confident, poised, and better adapted after the endurance running program.

Bruce⁽²⁶⁾ explored the relationship of physical fitness test scores to certain social, personal, and academic factors among selected ninth grade boys.

The subjects were divided into above average, average, and below average groups on the basis of physical fitness scores. The above average physically fit group scored higher on social factors than the other two groups.

Domingos⁽²⁸⁾ investigated the relationship of selected motor fitness scores of freshmen college women to aspects of their academic achievement. A battery of fitness tests were used as well as scores on the entrance examination and grade point averages. Analysis of the data did not show any relationship between motor fitness and academic achievement.

Keogh⁽¹⁶⁾ studied the relationship of motor ability and athletic participation to certain standardized personality measures. The California Psychological Inventory (CPI) was used to measure the personality items. Contrary to other findings, no significant relationship was found between either motor ability or athletic participation and the personality items.

Marler⁽³²⁾ did a study on personality variables of extramural participants and non-participants among women physical education majors. Two groups were equated on motor ability and academic achievement before taking the Edwards Personal Preference Schedule. Comparison of the means of the two groups showed that the participants were significantly lower than the non-participants on need for achievement and on test consistency scores. Comparison of both groups with a successful group of physical education students and teachers reported by Thorpe⁽⁴¹⁾ showed that both the participants and non-participants were significantly lower on need for Deference, Order, and Endurance, and were significantly higher on the need for Abasement and Nurturance.

Merriman⁽¹⁸⁾ investigated the relationship of personality traits to motor ability. His subjects included 808 high school boys and his measuring instruments were the Phillips JCR test and the California Psychological Inventory. Merriman's conclusions were that insofar as personality measures may be taken to indicate levels of adjustment, persons who are high in motor ability tend to be better adjusted than persons who are low in motor ability. The upper motor ability group scored significantly higher on the measures of poise, ascendancy, and self-assurance. From the fact that few significant differences in personality traits were found when athletes and non-athletes were matched according to motor ability, the inference might be drawn that motor ability rather than participation in athletics is a potent factor in the development of personality traits.

McMillen⁽³⁴⁾ explored the relationship between physical fitness as measured by the New York State Physical Fitness Test, and the academic index of high school girls. Partial correlation was found between physical fitness and academic index. Using the top and bottom quarters of the academic index distribution, those in the top quarter indicated a higher level of fitness than those in the bottom quarter.

Way⁽⁴³⁾ investigated the relationship between physical fitness and social adjustment of ninth grade boys. The subjects had scored highest on items measuring strength and endurance of the flexor muscles of the arms and shoulder girdle, and lowest on the item measuring explosive power of the leg muscles. As a group, the subjects were better adjusted in traits dealing with

alienation, purpose, and control than in traits dealing with happiness, sympathy, and impulse-judgment. Generally speaking, a rather low relationship was found between physical fitness and social adjustment.

LaSalle⁽¹⁷⁾ mentions at least two research studies indicating that athletic skill and personality adjustment have a significant positive correlation. Sperling found that varsity and intramural athletes rated higher than a non-athletic group in personality scores for ascendance and extroversion. Cabot's study on body build and personality revealed that boys of the athletic type are more likely to be ascendant and to take the lead in social situations.

Smart⁽²²⁾ explored the relationship between Kraus-Weber scores and personality adjustment of nursery school children. Some of the measuring instruments used were the Stanford-Binet Test, and ratings by nursery school teachers. Conclusions of the study showed that the personality variables correlated zero with chronological age, low and positively with mental age, but very positively at a level beyond chance with the Kraus-Weber scores.

In conclusion, there seems to be sufficient evidence of a definite relationship between personality and physical performance scores on motor ability and physical fitness tests. It is difficult to determine which trait came first - the more stable personality structure, or the ability to physically perform well. Smart⁽²²⁾ in his study with nursery school children suggests that perhaps it might be that emotionally stable children tend to use exercise more constructively than emotionally unstable children. If this were true, exercise would be a tool of a sound personality rather than a source of it.

III. BODY-IMAGE, SELF-CONCEPT, MOVEMENT-CONCEPT

These three areas will be considered together because in many respects, they are closely related. Perhaps it could be said that Body-Image and Movement-Concept are parts of the larger whole of Self-Concept. All three of these items are subjective, and may or may not be related to reality as it exists apart from an individual's perception of it.

Body-Image

William James⁽²⁹⁾ coined the phrase "body-image" and gave it a place in the total self picture. His reference was to the fact that a person's physical features have an important place in his concept of himself.

There is a fairly substantial amount of literature available regarding Body-Image; however, it is quite diversified, and some authors view the concept of Body-Image as synonymous and interchangeable with the concept of self. LaSalle illustrates this point of view:

The body is the symbol of the self, not only to the individual, but to the world at large. Speaking in terms of the complete unity of the organism, the body is the self. It is the sum-total of all that a person is. Whatever self one may have developed through the years, whatever strengths or weaknesses one may have, whatever personality or character one may have, are manifested through the body. These are not evident in the appearance only. They are evident in facial expressions, in wrinkles, in gestures, in voice, the movement, the excitement shown in pleasure, the anger or control in frustration and through all of the gamut of daily living experiences. The body, then, is the symbol of the self. (17:31)

McBee cites the comment of R. D. Scott in noting that "the relationship of the self to the Body-Image is still not clear, excepting that the separation of ego

consciousness appears at the same time the Body-Image becomes differentiated". (33:264) Schulz⁽³⁹⁾ noted in her study that in the child, more so than in older persons, Body-Image and self image are virtually indistinguishable. In the absence of other well developed personality resources, the child seems to depend more fully upon the effectiveness with which he can control his body. Consequently, as maturation continues, Body-Image would seem less crucial for self-esteem in the older individual.

One of the best single resources of information regarding Body-Image is Fisher and Cleveland's book Body Image and Personality. They note that the term "body" has taken on both explicit and implicit meanings in contemporary personality literature, which may be roughly distinguished in five overlapping categories. (3:ix) One current theory has equated body with body type. Sheldon, Stevens, and Kretschmer are probably the leaders in attempting to show relationships between dimensions of the body structure and a variety of personality traits. At this level, body is conceptualized principally as a series of measures of body structures. A second point of view has dealt with various measures of physiological function such as blood pressure and galvanic skin reflex in an attempt to integrate body responses and personality variables. A third category has dealt with the effects of serious body handicap or deformity as in the amputation of a limb. Within this framework, the body is a construct mainly defined relative to the defensive reactions it evokes from the personality. A fourth usage of the term body is in the area of psychosomatics. The attempt here has been to demonstrate meaningful linkages between personality concepts

and patterns of symptoms associated with certain types of body functioning. Within this framework body is primarily a symptom construct. It takes on the characteristics of a complicated screen upon which are projected symptom representations of personality patterns. In the reverse of this, Selye^(8:262) has offered another question. He comments that considerable work has been done in connection with psychosomatic medicine, but notes that very little systematic research has been done on the opposite of this: "the effect of bodily changes and actions upon mentality . . . such facts as that looking fit helps one to be fit". The fifth category is probably the least known and least explored concept of the body. It is the context with which this study was concerned - that of Body-Image as a term referring to the body as a psychological experience and as a focus on the individual's feelings and attitudes toward his body. Men who have explored the Body-Image concept, usually make the assumption that the manner in which the individual accomplishes the difficult task of meaningfully organizing the sensations from his body becomes one of the primary dimensions in his over-all system of standards for interpreting the world.

According to Schilder, as cited by Schulz⁽³⁹⁾, Body-Image is a dynamic rather than static concept. That is, the individual experiences his body as a gestalt which is in a constant state of flux and reorganization in the process of interacting with his environment. But, as Moustakas⁽³¹⁾ has noted, an individual will go to great lengths to maintain the totality of the Body-Image and will resist any change that threatens this integrity. Schilder, as cited by Schulz comments further on this:

Explorations of the body image never cease. The image can shrink, or expand or incorporate other objects. It can be completely rejected or projected to other people. Change does not necessarily mean a change in the actual structure of body, but the feeling toward the body in particular situations can cause a change in the image. For example, if the individual experiences fear the boundary may become very rigid and the image may shrink. Whereas in love or happiness the boundary may be almost non-existent and the image flow unlimited.

Although the individual strives for maintenance he also attempts to overcome the rigidity of the image. (39:17)

Several techniques such as the questionnaire, drawing a person, drawing the inside of the body, and self-ratings have been used to measure Body-Image. In experimenting with possible relationships between motor skill and personality, Fisher and Cleveland⁽³⁾ proposed an explanation of the existence in adults of individual differences in the degree of definiteness and strength the person ascribes to the boundaries or border zones of his body. To measure these differences they have developed a method of determining what they call "barrier scores". The score is a function of the individual's attitude toward his body. The score does not reflect either the individual's usual consciously verbalized self-concept or the actual structural characteristics of his body. Fisher and Cleveland have found that undergraduate students with high barrier scores are more interested and participate more in athletics than students with low barrier scores. In summarizing a series of case studies of high and low barrier men, Fisher and Cleveland found that the high barrier person seemed to be more effective in obtaining conventional rewards and satisfactions from life. If one focuses on conventional achievement and being effective in terms of usual societal norms, then the high barrier person may stand out as superior.

Self-Concept

I may doubt the reality of everything else; I cannot doubt the reality of myself. This is the intuition which has become so much the characteristic of modern times that we may regard it as a new insight. It is the discovery most graphically expressed by Descartes, that the self is the most certain of all things, the only thing absolutely certain. Whether or not Descartes correctly described the thing of which he was so sure has been much debated since he wrote; but the main point remains, the locus of supreme certitude is somewhere in the self-awareness of the thinking subject. (4:257)

Jersild in his book In Search of Self has defined the term self as, "A composite of thoughts and feelings which constitute a person's awareness of his individual existence, his conception of who and what he is. A person's self is the sum total of all that he can call his." (5:9) Because new experiences are constant and changing, the Self-Concept must also be dynamic in nature. Kelly in his article on "The Fully Functioning Self" has stated that "the formation of the Self-Concept is an achievement by each individual rather than an endowment given at birth. One is born into a social environment possessing only the equipment for self-achievement." (15:9) Jung in his book The Undiscovered Self (7) attempted to show the fallacy in thinking of man as a statistic or as a mass organism, and also emphasized the fact that the discovery of self is a purely personal and individual effort:

The inner man remains unchanged however much community he has. His environment cannot give him as a gift that which he can win for himself only with effort and suffering. On the contrary, a favorable environment merely strengthens the dangerous tendency to expect everything to originate from outside - even that metamorphosis which external reality cannot provide, namely, a deep-seated change of the inner man, which is all the more urgent in view of the mass phenomena of today and the still greater problems of the increase of population looming up in the future. (7:70)

In her article "The Self Image: A Theory of the Dynamics of Behavior",

Anderson noted that "the structure of the self-image determines the day-by-day and the moment-by-moment behavior. Decisions, choices, activities, and reactions are all determined in such a fashion as will best retain the image intact (satisfy the needs), rather than as reality calls for," (10:237)

Jung stated:

. . . Modern man can know himself only in so far as he can become conscious of himself - a capacity largely dependent on environmental conditions, the drive for knowledge and control of which necessitated or suggested certain modification of his original instinctive tendencies. His consciousness therefore orients itself chiefly by observing and investigating the world around him, and it is to its peculiarities that he must adapt his psychic and technical resources. This task is so exacting, and its fulfillment so advantageous, that he forgets himself in the process, losing sight of his instinctual nature and putting his own conception of himself in place of his real being. In this way he slips imperceptibly into a purely conceptual world where the products of his conscious activity progressively replace reality. (7:92-3)

In many respects, man is an enigma to himself. Although he yearns for total self-knowledge, he cannot attain it because he lacks the means of comparison necessary for self-knowledge. Jung commented that

Man knows how to distinguish himself from the other animals in point of anatomy and physiology, but as a conscious reflecting being, gifted with speech, he lacks all criteria for self-judgment. He is on this planet a unique phenomenon which cannot compare with anything else. The possibility of comparison and hence of self-knowledge would arise only if he could establish relations with quasi-human mammals inhabiting other stars. (7:55)

and yet, Jung also says,

there is and can be no self-knowledge based on theoretical assumptions, for the object of self-knowledge is an individual - a relative exception and an irregular phenomenon. Hence it is not the universal and the regular that characterize the individual, but rather the unique. He is not to be understood as a recurrent unit but as something unique and singular which in the last analysis can neither be known nor compared with anything else. (7:17)

Jung's frame of reference is essentially a clinical one, and the problem becomes one of using scientific data gathered from anonymous subjects, and then applying it insofar as possible to individuals. In an educational school atmosphere, the opportunity becomes one of making experiences available so that the self can be explored and strengthened. In contemporary society the problem of self identity becomes even more crucial because man is overwhelmed on every side by a broader scope of knowledge than ever before, and greater mobility than ever before, with the accompanying sense of futility and rootlessness.

But despite the overwhelming odds, and the inability of man to ever know all, there is still much to be gained from striving for a secure self-concept. It is perhaps the key to man's ability to be all he can. Combs, as cited by McBee, stated,

With a positive view of self one can risk taking chances: one does not have to be afraid of what is new and different. A sturdy ship can venture farther from port. Just so, an adequate person can launch himself without fear into the new, the untried and the unknown. A positive view of self permits the individual to be creative, original, and spontaneous. What is more, he can afford to be generous, to give of himself freely or to become personally involved in events. With so much more at his command, he has so much more to give. (33:24)

The central importance of the self cannot be over-emphasized. Jersild further commented that "It has been observed that individuals in situations which go against their view of themselves will reject these situations or defend themselves even if the situation would improve their way of life". (5:19-20) He further stated that "For the individual, maintenance of the self is the most stable

consistent value in his life. Wherever he is, whatever he does, the maintenance and enhancement of this self is the prime objective of his existence". (5:15)

Movement-Concept

Much theorizing has occurred in regard to movement, and a "movement-orientated" approach to teaching physical education has recently become prominent in women's physical education programs. Relatively little research has been done with the term Movement-Concept as it refers to that view an individual has of himself as a physically mobile entity; a view which is influenced by the Self-Concept and the Body-Image as known only to the individual. McBee cited the statement of H'Doubler:

It is in the performed arts that we discover the self through knowledge gained from the effects of our own acts. The body is not the total person. We possess it, but we live in our acts. (33:20)

Metheny has attempted to trace some of the relationship between the thought processes and the body. In a speech at the 1964 American Association for Health, Physical Education, and Recreation Convention, she stated that the "search for the connecting link between the behaviors of the psyche and the behaviors of the soma is now centered in three parts of the brain: the reticular network of the brain stem, the hypothalamus, and the cortex". (35:4)

There seems to be an important relationship between the way an individual perceives his movement, and the way he actually moves. A negative image can result in a movement which is inferior to the individual's actual ability. Or, a positive attitude can draw on otherwise dormant or perhaps in-

hibited potential.

To each individual, movement can be a very profound thing, and it can mean whatever it suggests to the person. Metheny further stated:

the seemingly trivial act of tossing a ball at a target becomes an important part of each child's urgent search for the meaning of his personal existence within the existential scheme of reality - as-he-knows-it. Accordingly, this attempt may be construed as a part of his on-going search for satisfying answers to his most urgent questions: What am I? Who am I? What does my self-centered life mean to me? To other men? And to the enduring universe of my transient personal existence?(35:8)

Studies Related to Body-Image, Self-Concept, and Movement-Concept

Doudlah's⁽²⁹⁾ study attempted to find the relationship between Self-Concept, Body-Image, and Movement-Concept of college freshmen women with low and average motor ability. To do this, she devised three sets of seventy-five statements which were sorted by each subject according to "most like" through "least like". This Q-Sort was then scored according to the degree of difference between the actual and ideal image for Self-Concept, Body-Image, and Movement-Concept. Doudlah found a significant relationship between motor ability and Movement-Concept, but not between motor ability and Body-Image or Self-Concept. She interpreted this finding as seeming "to indicate that the actual motor performance on items such as are included in the Scott Motor Ability Test are influenced by how the subject perceived herself as a moving being or the possibility that motor ability so influences conceptualization that movement becomes an integral part of the individual's self". (35:39) Doudlah found a similar trend appearing when the low and average motor ability groups were

compared. No significant differences were found between the groups in the area of Self-Concept or Body-Image, but a significant difference was found in Movement-Concept which might suggest that "movement, or perceiving oneself as an adequate mover was more characteristic of the average motor ability group than of the low motor ability group". (35:39)

Herod⁽³¹⁾ reviewed literature in neurology, physiology, psychology, psychoanalysis, and rehabilitation in an attempt to find implications for physical education from the Body-Image concept. She found indications that the Body-Image is constantly changing and developing, that it is affected by tactile and kinesthetic sensations, that it depends partly on social and cultural factors, and that individual behavior is influenced by the security of the image. The major implications for physical education were that physical education should broaden its scope to include sensory motor experiences for the development of a strong image, and that group counseling should be used to aid in developing a secure Body-Image.

Schulz⁽³⁹⁾ explored the possible relationships between Body-Image and physical performance in adolescent girls. To measure physical performance she used a test consisting of four items: balance on stick, obstacle race, wall pass, and standing broad jump. To measure Body-Image she used the semantic differential test where the subject rated herself on a seven point scale consisting of twenty-one bi-polar words, and also the "Draw a Person Test". Schultz found that a definite relationship did exist between Body-Image and physical performance. She also found that the subjects who were poor performers

physically, tended to score low on the Body-Image tests as well, and the subjects who were better performers physically tended to score higher on the Body-Image tests.

Parker⁽³⁷⁾ explored the relationship between motor ability and Self-Concept of women non-physical education major students and physical education major students. Motor ability was measured by the Scott Three-Item Motor Ability Battery, and Self-Concept was determined on the basis of scores on the twenty-statement "Who Am I" test. Results of the study showed no significant relationship between motor ability and Self-Concept scores; however, there was a slight but negative relationship between motor ability and Self-Concept by the low and high non-physical education major groups. Slight but positive relationships were found between motor ability and Self-Concept scores for the middle non-physical education major and the physical education major groups. Parker was not altogether satisfied with the Twenty-Statement Test because it measures the degree of social anchorage or identification of self in a social system rather than that aspect of Self-Concept concerned with the recognition and organization of attitudes of others toward the self during various communicative activities. She felt that the addition of another measuring instrument might have produced very different results.

Cogan⁽²⁷⁾ investigated the degree of self understanding gained through college programs of physical education for men. His study was based on interviews with psychiatrists, psychologists, physical educators, and persons in related professions, supplemented by a review of the literature. Body-Image,

Self-Concept, and Movement-Concept were explored, although these exact terms were not used in every case. Cogan concluded that the possibilities for developing self-understanding through physical education appeared almost limitless, although they have been relatively unexplored to date.

McBee⁽³³⁾ investigated self conceptualization in movement. As measuring instruments, the ball throwing and broad jumping items of the Smith-Clifton Perception Checklist were used along with the Hunt-Weber Body Image Projective Test which is based on the self and ideal image. Results showed that a secure body image was significantly related to secure feelings about the movement patterns of ball throwing and broad jumping.

Nation⁽³⁵⁾ attempted to determine the effect of physical education instruction upon Movement-Concept. She used the Q-Sort for Movement-Concept as developed by Doudlah, and worked with classes in fencing, body mechanics, and swimming. The groups were tested before and after five weeks of instruction. Of the three groups, the swimming class made the greatest change in Movement-Concept, and the fencing class showed the next greatest degree of change. There was no significant difference in Movement-Concept scores for the subjects in body mechanics after five weeks of instruction. The changes that did occur showed less difference between the self and ideal movement image.

Clifton and Smith⁽¹¹⁾ explored the effect of viewing oneself performing motor skills on the expressed concept of self in performance. Their subjects consisted of both men and women. As measuring devices, the walking, running,

catching, throwing, and broad jump items on the Smith-Clifton Perception Checklist were used. The groups of subjects were organized so that some performed alone, and some performed in groups; some viewed loop films alone, and some viewed them in groups; and some did not view the loop films at all. Results showed that scores for all of the groups tended to be higher after performance of the skills, but there were significantly more positive scores obtained from the experimental subjects after they viewed films of their performance.

In conclusion, there appears to be some uncertainty concerning the relationship of Body-Image, Self-Concept, and Movement-Concept to each other and to physical performance. It would seem safe to say that secure Body-Image scores appear to be fairly consistently related to better physical performance. Self-Concept has been widely explored by many disciplines, but many gaps still exist. Nevertheless, one could perhaps venture to say that a secure sense of self is man's highest possession for reaching his greatest potential. Movement-Concept appears to be definitely related to an individual's actual performance. Through Body-Image, Self-Concept, and Movement-Concept, physical education seems to have almost unparalleled opportunity to assist the individual in his development; however, widespread application of this knowledge is still in the theory stage. Certainly more research is needed on the effects and implications of these concepts, and physical educators who are able to intelligently relate to psychology are needed in both the areas of research and teaching.

CHAPTER IV

PROCEDURE

I. SELECTION OF SUBJECTS

Twelve women physical education major students (six freshmen, two sophomores, four juniors), who scored below a T-score of fifty on the Iowa Physical Fitness Test at the University of North Carolina at Greensboro in the fall of 1963 were selected as subjects for this study. They were contacted to determine their willingness to participate, but were not informed about the purpose or details of the study. For testing purposes, the identity of the subjects was kept anonymous to the investigator by the assignment of numbers with the hope that greater honesty would result.

II. SELECTION OF TEST ITEMS AND CONDITIONING PROGRAM

The Iowa Physical Fitness Test was used to measure the four fitness variables (1) Physical Fitness (2) Abdominal Strength (3) Physical Endurance (4) Arm and Shoulder Strength. This test was selected because it is used by the University of North Carolina at Greensboro to test all majors, and the subjects had been selected on the basis of scores earned on it. Several batteries are available for this test. The one used in this study includes the Push-Pull, Chair-Stepping, and Sit-Ups. The reliability for this combination is .688. Although

norms are available in published form, the ones used to score this test were gathered at the University of North Carolina at Greensboro. Directions for the test appear in the Appendix.

A Q-Sort technique, as developed by Doudlah⁽²⁹⁾, was used to measure three of the personality variables (1) Body-Image (2) Self-Concept (3) Movement-Concept. Both Doudlah and Nation⁽³⁶⁾ found this particular Q-Sort to be a satisfactory measure. The items of Body-Image, Self-Concept, and Movement-Concept are yet relatively unexplored as far as adequate testing devices are concerned. Q-Sort methodology consists of the subjects sorting a set of statements into a predetermined number of categories. Subjects are instructed to sort the statements according to the degree which they characterize the self and ideal self. In this study, sets of seventy-five statements each, on Body-Image, Self-Concept, and Movement-Concept, as constructed by Doudlah, were used for Q-Sorting. Copies of these statements appear in the Appendix.

A nine point scale was set up with the left-hand side labeled "least like" and the right-hand side labeled "most like". Through the use of a predetermined distribution of the number of statements, the subject was forced to place the two statements which she felt were least like her under column one and the two statements which she felt were most like her under column nine with the others rated accordingly. The seventy-five statements were sorted according to the following scale:

LEAST LIKE					MOST LIKE			
1	2	3	4	5	6	7	8	9
(2)	(5)	(9)	(13)	(17)	(13)	(9)	(5)	(2)
(Number of statements allowed in each column)								

Each set of statements must be categorized twice - once from the point-of-view of the self at the present moment in time, followed by how one would ideally like to be. The test is then scored according to the difference between the self and ideal-sort. A nomograph may be used for determining the correlation coefficient between the self-sort and ideal-sort. Doudlah constructed such a nomograph and a copy of it appears in the Appendix. To determine the correlation coefficient for each individual subject the following procedure was used: the difference between the self and ideal score for each of the seventy-five statements was squared. These scores were then totaled to get the sum of D^2 . For any sum of D^2 from zero to 510, the nomograph was entered from the left at the level of the D^2 sum. By proceeding to the diagonal line and then down, the value of r was read off the bottom (positive) scale. If the sum of D^2 were within the 511 to 1022 range, the nomograph was entered from the right and the value of r was read off the top (negative) scale.

The Edwards Personal Preference Schedule was used to measure the remaining four personality variables (1) Achievement (2) Autonomy (3) Succorance (4) Personality Endurance. The care and intricacy with which this inventory was developed recommends it highly, and this was the primary reason it was chosen. This test was first copyrighted in 1954 by Allen Edwards⁽²⁾ of the University of

Washington. The scores from only four of the personality variables in this test were used in this study; however, the EPPS provides measures for the following fifteen items: (1) Achievement (2) Deference (3) Order (4) Exhibition (5) Autonomy (6) Affiliation (7) Intraception (8) Succorance (9) Dominance (10) Abasement (11) Nurturance (12) Change (13) Endurance (14) Heterosexuality and (15) Aggression. In addition to the above fifteen personality variables, the EPPS provides a measure of test consistency in the form of a score. This schedule is quite unique in several respects. The usual personality inventory consists of a set of statements relating to personality traits that are answered in a "yes" or "no" fashion as the statement either does or does not characterize the subject. Such a method of response has a tendency to be answered according to how socially desirable each statement is considered by the subject. In the EPPS an attempt has been made to minimize the influence of social desirability in responses. Statements are paired and the subject is forced to choose one over the other when often one statement is no more socially desirable than the other. Each item is paired with every other one and in this way the consistency of choices can also be determined. Norms are available for the EPPS both in percentiles and T-Scores. For calculating purposes, raw scores should be used rather than percentiles.

The XBX exercise series developed by the Royal Canadian Air Force⁽²⁰⁾ was used for the purpose of increasing the level of physical fitness of the subjects in this study. This particular exercise series was chosen because it was carefully constructed and specifically designed for women. Over six hundred

girls and women of all ages participated in its development. Experiments were carried out with a wide variety of exercises to determine those most effective in producing a higher level of physical fitness. To measure the degree of increase, a series of physical fitness tests were administered which included an examination of muscular strength and endurance, testing of heart response to activity, and measurement of fat layers. Finally, the ten best exercises were selected to make up the XBX series. Time limits were then established for each exercise, and the whole series only takes a total of twelve minutes.

III. ADMINISTRATION OF TESTS AND EXERCISE PROGRAM

To begin this study, the twelve subjects met together on two successive days, first to take the Edwards Personal Preference Schedule, and then to take the Q-Sort. Following this, the subjects began a thirty day conditioning program to improve their level of physical fitness.

Except for one or two people at a time who had conflicting schedules, the entire group of subjects met together each day to perform the XBX exercise series. On Sunday of each week, the subjects did not meet as a group, but did four of the exercises individually (Floor-Touch, Sit-Ups, Push-Ups, Run-With Squat-Jumps). Records of progress were kept by each subject to show improvement in the number of exercises performed during the time limit - (See Appendix). Four of the girls exercised thirty-one days, one only completed twenty-nine days and all of the other girls exercised thirty days.

At the end of the conditioning period, the twelve subjects met together

and again took the Iowa Physical Fitness Test to determine if their level of fitness had increased as a result of the thirty day exercise period. Following this, the subjects were then readministered the Edwards Personal Preference Schedule and the Q-Sort to determine whether any possible changes might have occurred during the conditioning program. Because the subjects were familiar with the testing procedure, they were all given a set of the two personality tests and asked to turn in the completed answer sheets within the next two days. When all of the answer sheets had been collected, the subjects were informed by letter about the purpose and details of the study.

IV. TREATMENT OF DATA

The data gathered was essentially treated in two ways. The differences were found between the beginning and end scores for the eleven physical fitness and personality variables. Also correlations between the eleven variables prior to the conditioning program were calculated.

The t-test was used to determine the significance of the differences between the scores on the eleven variables before and after the thirty day exercise period. Differences were also calculated between the Body-Image, Self-Concept, and Movement-Concept using the scores gained from comparing the beginning and end self-sort with the scores gained from comparing the beginning and end ideal-sort. The mean of the differences and standard deviation were also computed. The following formula was used:

test of significance

$$t = \frac{M_D}{\sqrt{\frac{\sum d^2}{N(N-1)}}$$

Possible inter-relationships between the eleven variables before treatment were determined by completing forty-nine correlations. Since the sample was small, the following formula was used in preference to the Pearson-Product-Moment scattergram.

$$\sum_{XY} - \frac{\sum X \sum Y}{N}$$

r =

$$\sqrt{\left(\sum X^2 - \frac{(\sum X)^2}{N}\right) \left(\sum Y^2 - \frac{(\sum Y)^2}{N}\right)}$$

CHAPTER V

ANALYSIS AND INTERPRETATION OF DATA

I. ANALYSIS OF DATA

The purpose of this study was to improve the originally low level of physical fitness of subjects majoring in physical education at the University of North Carolina at Greensboro, and to investigate the effects of this change on selected personality variables.

Another purpose was to determine possible inter-relationships between the physical fitness and personality variables prior to the conditioning program. The following eleven variables were used: (1) Physical Fitness as measured by the Iowa Physical Fitness battery consisting of items which measure (2) Abdominal Strength (3) Physical Endurance and (4) Arm and Shoulder Strength; three Q-Sort items of (5) Body-Image (6) Self-Concept and (7) Movement-Concept; and four of the fifteen items from the Edwards Personal Preference Schedule which were (8) Achievement (9) Autonomy (10) Succorance, and (11) Personality Endurance.

Twelve women physical education major students (six freshmen, two sophomores, four juniors), who scored below a T-score of fifty on the Iowa Physical Fitness Test at the University of North Carolina at Greensboro in the fall of 1963 were selected as subjects for this study.

The Edwards Personal Preference Schedule and Q-Sort tests for Body-Image, Self-Concept, and Movement-Concept were completed by the subjects prior to the beginning of the thirty day XBX conditioning period. Upon completion of the conditioning program, the subjects again took the Edwards Personal Preference Schedule, Q-Sort tests and the Iowa Physical Fitness Test.

The data were then essentially treated in two ways. The differences were found between the beginning and end scores for the eleven physical fitness and personality variables. Also, correlations between the eleven variables prior to the conditioning program were calculated. For the items of Body-Image, Self-Concept, and Movement-Concept, correlation coefficients were obtained by means of a nomograph and these correlation coefficients were considered as individual scores throughout the statistical procedure. The "t" test was used to determine the significance of the difference between the scores on the eleven variables before and after the thirty day exercise period. Differences were also calculated between the Body-Image, Self-Concept, and Movement-Concept using the scores gained from comparing the beginning and end self-sort with the scores gained from comparing the beginning and end ideal-sort. These data are presented in Table I.

The greatest differences before and after the conditioning program occurred in the areas of Physical Fitness, Abdominal Strength, Body-Image, and Movement-Concept using the scores gained from comparing the beginning and end self-sort with the scores gained from comparing the beginning and end ideal-sort. The differences for these four items were all significant at the one

TABLE I

MEAN OF THE DIFFERENCES, STANDARD DEVIATION OF THE DIFFERENCES, AND SIGNIFICANCE OF DIFFERENCE BETWEEN THE PERSONALITY AND PHYSICAL FITNESS VARIABLES BEFORE AND AFTER THE EXERCISE PERIOD

Variable	M _D	S. D.	Significance of Difference
Physical Fitness	6.833	6.492	3.492 *
Abdominal Strength	17.917	17.139	3.467 *
Physical Endurance	1.500	8.362	.595
Arm and Shoulder Strength	.750	5.418	.459
Body-Image	.143	.134	3.178 *
Self-Concept	.121	.130	.978
Movement-Concept	.094	.195	1.710
Achievement	1.500	2.179	2.283 **
Autonomy	1.333	3.400	1.301
Succorance	- .833	3.923	- .704
Personality Endurance	-2.250	4.512	-1.654
Body-Image (Beginning and end self with beginning and end ideal)	.006	.130	.133

TABLE I (continued)

Variable	M _D	S. D.	Significance of Difference
Self-Concept (Beginning and end self with beginning and end ideal)	.113	.161	2.510 **
Movement-Concept (Beginning and end self with beginning and end ideal)	.153	.137	3.400 *

*Significant at 1% level of confidence (2.819)

**Significant at 5% level of confidence (2.074)

per cent level of confidence. Differences significant at the five per cent level of confidence were found for Achievement and for Self-Concept when the beginning and end self were compared with the beginning and end ideal.

Possible inter-relationships between the eleven variables before the conditioning program were determined by completing forty-nine correlations. As seen in Table II, only two variables indicated a significant relationship prior to the conditioning program. These items were Abdominal Strength and Achievement. This relationship was significant at the five per cent level of confidence.

II. INTERPRETATION OF DATA

The significant difference in Physical Fitness and in Abdominal Strength would indicate that the purpose of improving physical fitness in this study, was achieved. Apparently the choice of a thirty day exercise program was satisfactory, as well as the XBX method of increasing physical fitness as measured in this study. It is understandable that Arm and Shoulder Strength did not increase significantly in view of the relatively slight emphasis on this area in the XBX series. The lack of a significant increase in Endurance is surprising in view of the rigorous three minutes of running with squat-jumps. It might have appeared that the extreme increase in Abdominal Strength would have served to raise the overall level of Physical Fitness significantly; however, since T-scores were used to equate the physical fitness variables, one did not receive any more emphasis through weighting than another. Presently used physical fitness tests tend to measure motivation as well as fitness because they require

TABLE II

CORRELATION COEFFICIENTS BETWEEN PERSONALITY AND
PHYSICAL FITNESS VARIABLES ON THE BASIS OF INITIAL SCORES

Variables	B. I.	S. C.	M. C.	ACH.	AUT.	SUC.	PER. END.
PHYS. FIT.	-.028	-.318	-.059	.112	.277	-.123	-.304
ABD. STR.	-.205	-.509	-.457	.684 **	.134	.076	-.424
PHYS. END.	.286	.400	.447	.117	.081	-.017	.150
ARM-SH. STR.	-.014	-.027	.018	-.024	.002	-.005	.035
BODY IMAGE	_____	.215	.409	-.068	.288	.099	.307
SELF CONCEPT	_____	_____	.544	-.089	.173	-.039	.318
MOVE. CON.	_____	_____	_____	.103	.166	-.246	.356
ACH.	_____	_____	_____	_____	.376	.287	-.507
AUT.	_____	_____	_____	_____	_____	.158	-.282
SUC.	_____	_____	_____	_____	_____	_____	-.554

*Significant at the 1% level of confidence (.708)

**Significant at the 5% level of confidence (.576)

VARIABLES:	Body-Image	Physical Fitness
	Self-Concept	Abdominal Strength
	Movement-Concept	Physical Endurance
		Arm and Shoulder Strength
	Achievement	
	Autonomy	
	Succorance	
	Personality Endurance	

a willingness to push oneself physically. The fact that the subjects in this study were able to keep records of their progress during the conditioning program probably served as a good motivator. Wireman⁽²⁴⁾ found that knowledge of results seemed to be the best approach to increasing physical fitness.

Body-Image was also found to have changed significantly after the conditioning program. The self and ideal image became more similar, resulting in a more secure Body-Image. This was an anticipated result of increased physical fitness.

When the scores for Body-Image, Self-Concept, and Movement-Concept obtained from comparing the beginning and end self-sort with the scores obtained from comparing the beginning and end ideal-sort, were considered, the results were mainly indicative of internal agreement between these variables. An inverse relationship should exist between these scores and the ones gained from comparing the beginning self and ideal with the end self and ideal. This did occur. Such an outcome indicates that for Self-Concept and Movement-Concept, the difference between the self and ideal scores did not change very much as a result of the conditioning program, but they did change significantly for Body-Image.

The personality variable of Achievement also showed a significant difference following the conditioning period. This variable implies self-confidence and a high level of aspiration. Thus, it would appear that increased physical fitness would also tend to increase one's ability to utilize his personality potential.

Correlation coefficients were completed between the eleven variables prior to the conditioning period to determine which variables were related. This served to reinforce the differences found as a result of the conditioning program. Those variables which were similar could also be expected to change similarly. This did occur. The only variables which were significantly related prior to the conditioning program were those of Abdominal Strength and Achievement. It is not surprising that these two items were correlated. In many respects, the abdominal area is central to physical power. It is basic to good posture and bodily control. Particularly with women, good abdominal strength would also seem to enhance self-confidence through aiding in good bodily carriage and appearance. Many dancers emphasize the abdominal area as the source of movement and control, where action originates. The characteristic of Achievement would seem to be related to these qualities demonstrated by Abdominal Strength.

The implications of the following results will be entirely speculative in nature because none of the findings to be mentioned occurred at a significant level of confidence in this study. Consequently their meaning is limited because they could be the result of chance as well as an increased level of physical fitness.

Three other studies reviewed in Chapter III used the Edwards Personal Preference Schedule as a measuring instrument. Conclusions from those studies compare somewhat favorably with the findings from this study, but only when results from this study which did not reach a level of significance are considered. In the present investigation, when scores prior to the conditioning program were

compared, Succorance and Personality Endurance tended to appear negatively related, but at less than the five per cent level of confidence. Harris⁽³⁰⁾ used the Edwards Personal Preference Schedule with a group of physical education majors with high and low physical fitness indices. The upper group obtained higher scores on Personality Endurance; whereas, the lower group had a higher mean on Succorance. Thorpe⁽⁴¹⁾ used the Edwards Personal Preference Schedule to measure personality variables among successful women students and teachers in physical education. This group scored high in Personality Endurance and low in Succorance. Rogers⁽³⁸⁾ used the Edwards Personal Preference Schedule to compare personality variables of physical education majors who were successful in student teaching with those who were not. Results of the study showed little difference between the two groups; however, there was considerable difference when they were compared with a normative group of college women. The physical education majors scored higher on Endurance and lower on Succorance.

All three of these studies seem to indicate a trend for physical education people to be higher in the personality characteristic of Endurance, and lower in Succorance. Such an assumption is still too general however, and must be made in relationship to the measuring instrument used (the Edwards Personal Preference Schedule). It may be that people inclined toward more physically rugged activity merely express their attitudes differently than other groups, and if this were true, they might only appear to be lower in characteristics such as Succorance. On the other hand, such a difference might be actual. More knowledge is required here, and different types of measuring

instruments need to be devised and applied, so that results from differing points of view can be compared.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purpose of this study was to improve the originally low level of physical fitness of twelve women majoring in physical education at the University of North Carolina at Greensboro, and to investigate the effects of this change on selected personality variables.

Another purpose was to determine possible inter-relationships between the physical fitness and personality variables prior to the conditioning program. The following eleven variables were used: (1) Physical Fitness (2) Abdominal Strength (3) Physical Endurance (4) Arm and Shoulder Strength, plus three Q-Sort items of (5) Body-Image (6) Self-Concept (7) Movement-Concept, and four items from the Edwards Personal Preference Schedule which were (8) Achievement (9) Autonomy (10) Succorance, and (11) Personality Endurance.

The Iowa Physical Fitness Test was used to measure the first four physical fitness variables. A Q-Sort technique, as developed by Doudlah was used to measure Body-Image, Self-Concept, and Movement-Concept. The Edwards Personal Preference Schedule was used to measure the remaining four personality variables. The XBX exercise series developed by the Royal Canadian Air Force was used for the purpose of increasing the level of physical fitness of the subjects in this study.

The subjects included six freshmen, two sophomores, and four juniors who scored below a T-score of fifty on the Iowa Physical Fitness Test. At the beginning of

the study, the subjects were administered the two personality tests (Q-Sort and EPPS). Following this, they began a thirty day conditioning program to improve their level of physical fitness. At the end of the conditioning period, the twelve subjects were re-administered the Iowa Physical Fitness Test to determine if their level of fitness had increased. They were also readministered the two personality tests.

The data gathered was treated in two ways. The differences were found between the beginning and end scores for the eleven physical fitness and personality variables. Also, correlations between the eleven variables prior to the conditioning program were calculated.

Only two variables indicated a statistically significant relationship prior to the conditioning program. These items were Abdominal Strength and Achievement. This relationship was significant at the five per cent level of confidence.

The greatest differences before and after the conditioning program occurred in the areas of Physical Fitness, Abdominal Strength, and Body-Image. The differences for these three items were all significant at the one per cent level of confidence. Achievement was found to be significantly different at the five per cent level of confidence.

The following conclusions may be drawn from this study:

1. A thirty day conditioning program using the XBX exercise series significantly increased the level of physical fitness of the twelve subjects involved in this study - particularly Abdominal Strength, as measured by the Iowa Physical Fitness Test.
2. Abdominal Strength as measured by the Iowa Physical Fitness Test was

significantly related to Achievement as defined and measured by the Edwards Personal Preference Schedule.

3. Increased physical fitness resulted in a more secure Body-Image and higher Achievement as defined and measured by Doudlah's Q-Sort and the Edwards Personal Preference Schedule.

The definitely improved level of physical fitness and the internal consistency of results for the personality variables used in this study, seem to indicate that the measuring instruments are satisfactory for further exploration into the areas of physical fitness and personality.

Limitations of this Study and Suggestions for Further Investigation:

1. The small number of subjects used in this study may have resulted in less predictive accuracy than might have resulted with a larger group of subjects.
2. Correlations could also have been completed between the eleven variables at the end of the conditioning program to note any changes or similarities to those correlations completed prior to the conditioning program.
3. The same research design could be used with the substitution of other measuring instruments to determine if similar results would occur.
4. The same research design and measuring instruments could be used on a group of subjects with a high level of physical fitness from the beginning.
5. The same research design and measuring instruments could be used on a group of subjects with majors others than physical education.

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APPENDIX

TABLE III

RAW DATA
IOWA PHYSICAL FITNESS TEST SCORES BEFORE AND AFTER
EXERCISE PERIOD (GIVEN IN T-SCORES)

Subject	Sit-Ups	Chair Stepping	Total Push-Pull	Average T-Score
1	52 / 45	42 / 37	51 / 50	48 / 44
2	55 / 66	39 / 41	47 / 52	47 / 53
3	38 / 51	41 / 53	55 / 50	45 / 51
4	49 / 61	42 / 55	45 / 39	45 / 52
5	10 / 41	59 / 52	49 / 57	39 / 50
6	39 / 50	52 / 55	50 / 49	47 / 51
7	33 / 57	57 / 59	50 / 52	47 / 56
8	49 / 57	54 / 55	40 / 35	48 / 49
9	7 / 74	61 / 63	41 / 42	36 / 60
10	47 / 64	46 / 32	48 / 61	47 / 52
11	42 / 55	37 / 52	59 / 61	46 / 56
12	37 / 52	35 / 29	42 / 44	38 / 41

TABLE IV

RAW DATA

Q-SORT SCORES FOR BODY-IMAGE, SELF-CONCEPT, MOVEMENT-
CONCEPT BEFORE AND AFTER THE EXERCISE PERIOD

Subject	Body-Image (be-af)	Self-Concept (be-af)	Movement-Concept (be-af)
1	.710 / .790	.350 / .515	.580 / .757
2	.400 / .423	.295 / .618	.343 / .400
3	.655 / .655	.523 / .664	.530 / .523
4	.483 / .734	.620 / .688	.295 / .680
5	.747 / .650	.767 / .755	.631 / .517
6	.378 / .533	.695 / .843	.763 / .785
7	.443 / .599	.743 / .833	.730 / .783
8	.480 / .525	.633 / .755	.346 / .680
9	.496 / .735	.652 / .703	.739 / .710
10	.488 / .730	.001 / .320	.250 / .235
11	.040 / .235	.379 / .587	.314 / .450
12	.225 / .650	.460 / .289	.110 / .589

(correlation coefficient obtained from nomograph used as raw score)

TABLE V
RAW DATA
EDWARDS PERSONAL PREFERENCE SCHEDULE SCORES BEFORE
AND AFTER EXERCISE PERIOD
(GIVEN IN RAW SCORES - AS USED IN CALCULATIONS)

Subject	<u>Ach</u> (be-af)	<u>Aut</u> (be-af)	<u>Suc</u> (be-af)	<u>End</u> (be-af)	<u>Con</u> (be-af)
1	9 / 7	11 / 13	4 / 6	23 / 14	13 / 12
2	10 / 10	16 / 19	22 / 22	4 / 4	9 / 14
3	9 / 9	15 / 16	17 / 12	11 / 8	13 / 14
4	13 / 17	8 / 5	24 / 24	17 / 21	10 / 13
5	11 / 15	15 / 10	13 / 13	23 / 21	13 / 10
6	25 / 24	18 / 16	15 / 18	11 / 2	12 / 11
7	5 / 8	3 / 5	10 / 9	15 / 14	15 / 14
8	12 / 14	19 / 18	15 / 16	7 / 8	14 / 15
9	11 / 9	8 / 15	17 / 9	17 / 11	11 / 14
10	16 / 17	7 / 9	18 / 12	9 / 7	14 / 13
11	8 / 12	9 / 14	7 / 5	18 / 12	9 / 13
12	10 / 12	5 / 10	14 / 21	11 / 17	8 / 6 *

*Scores having a consistency of less than 9 may be questioned.

ABBREVIATIONS: Ach - Achievement be - before
Aut - Autonomy af - after
Suc - Succorance
End - Personality Endurance
Con - Consistency

TABLE VI
RAW DATA
EDWARDS PERSONAL PREFERENCE SCHEDULE SCORES BEFORE
AND AFTER EXERCISE PERIOD
(GIVEN IN PERCENTILE SCORES - NOT USED IN CALCULATIONS)

Subject	<u>Ach</u> (be-af)	<u>Aut</u> (be-af)	<u>Suc</u> (be-af)	<u>End</u> (be-af)	<u>Con</u> (be-af)
1	19 / 8	45 / 62	3 / 9	99 / 69	83 / 63
2	27 / 27	82 / 96	99 / 99	5 / 9	11 / 96
3	5 / 19	77 / 82	86 / 51	44 / 24	83 / 96
4	58 / 84	20 / 6	99 / 99	80 / 95	24 / 83
5	36 / 72	77 / 36	59 / 59	99 / 95	83 / 24
6	99 / 99	92 / 82	76 / 90	44 / 0	63 / 43
7	3 / 13	1 / 6	33 / 25	69 / 63	99 / 96
8	47 / 64	96 / 92	76 / 81	18 / 24	96 / 99
9	36 / 19	20 / 77	86 / 25	80 / 44	43 / 96
10	79 / 84	13 / 28	90 / 51	30 / 24	96 / 83
11	13 / 47	28 / 70	13 / 6	85 / 50	11 / 83
12	27 / 47	6 / 36	67 / 98	44 / 80	4 / 1 *

*Scores having a consistency of less than 11 may be questioned.

ABBREVIATIONS:

Ach - Achievement
Aut - Autonomy
Suc - Succorance
End - Personality Endurance
Con - Consistency

be - before
af - after

TABLE VII

RAW DATA

Q-SORT SCORES FOR BODY-IMAGE, SELF-CONCEPT, AND
MOVEMENT-CONCEPT COMPARING THE SCORE GAINED FROM THE
SELF AT THE BEGINNING WITH THE END, AND THE SCORE
GAINED FROM THE IDEAL AT THE BEGINNING WITH THE END

Subject	<u>Body-Image</u> (self/ ideal)	<u>Self-Concept</u> (self/ ideal)	<u>Movement-Concept</u> (self/ ideal)
1	.807 / .760	.695 / .773	.746 / .822
2	.708 / .870	.588 / .844	.730 / .848
3	.717 / .610	.643 / .773	.570 / .704
4	.789 / .849	.808 / .808	.643 / .907
5	.715 / .850	.797 / .805	.643 / .790
6	.809 / .750	.790 / .853	.830 / .918
7	.810 / .783	.846 / .820	.823 / .800
8	.650 / .717	.818 / .820	.283 / .807
9	.843 / .520	.812 / .743	.790 / .830
10	.843 / .777	.339 / .859	.647 / .819
11	.756 / .790	.590 / .700	.595 / .657
12	.510 / .663	.439 / .723	.535 / .766

TABLE VIII
 XBX EXERCISE SERIES RECORD

Subject	Number of Exercise Days	Specific Exercises (beginning and end) number of repetitions									
		1	2	3	4	5	6	7	8	9	10
1	30	10	12	10	18	29	18	46	20	5	150/26
		14	23	14	22	36	28	103	14	14	200/40
2	31	8	11	8	24	39	34	28	18	7	192/30
		22	40	17	45	57	144	132	37	14	300/53
3	29	9	17	14	26	34	38	78	14	7	180/30
		30	24	18	29	45	70	118	26	12	250/42
4	30	16	19	12	28	31	31	94	12	10	120/20
		26	28	18	34	49	49	130	25	17	288/50
5	31	12	18	14	19	30	43	60	14	5	168/30
		21	26	18	34	42	75	108	17	14	250/45
6	31	10	18	10	26	31	33	42	17	6	160/30
		15	25	17	32	41	74	112	12	8	272/50
7	30	12	17	13	40	34	52	53	15	5	184/30
		21	30	20	44	56	77	92	29	11	300/60
8	30	15	19	14	23	39	32	72	13	11	196/30
		23	24	15	29	43	76	117	19	15	245/40
9	30	8	15	11	21	27	20	39	23	6	189/30
		19	30	19	33	49	110	115	34	16	302/60
10	31	10	12	9	16	32	17	37	13	4	150/29
		19	25	20	39	49	60	110	27	15	300/50

TABLE VIII (continued)

Subject	Number of Exercise Days	Specific Exercises (beginning and end) number of repetitions									
		1	2	3	4	5	6	7	8	9	10
11	30	15	11	10	19	21	15	44	20	6	185/30
		19	24	16	30	48	55	110	23	10	250/43
12	30	13	16	10	24	27	23	40	20	6	129/20
		20	26	18	35	48	69	97	24	14	292/50

*See page 81 for description of XBX exercises 1-10.

IOWA PHYSICAL FITNESS TEST DIRECTIONS

PUSH AND PULL (hand dynamometer)

1. Hold the apparatus in front of the chest, one hand on each handle; elbows bent and arms in a horizontal plane.
 2. Pull as hard as possible (assistant records score and resets dynamometer).
 3. In same position, push in on apparatus as hard as possible; the heel of the hand may be used.
 4. Do not brace the apparatus against the chest in either trial, and keep it centered with the body.
- (A towel may be used to dry perspiration from hands)

CHAIR STEPPING (use chairs of a standard type - 18 inches high)
one chair for every three students

1. Work in groups of threes . . . one - performs
two - holds chair and right hand of subject
three - holds chair and counts aloud number of times subject mounts chair.
2. The starting position is beside the chair with one foot on the chair and the right hand in partner's hand. (MAINTAIN THIS POSITION throughout the test)
3. On the signal, Ready Go, rise to an erect position on the chair; the supporting knee must be straight, the other foot may be off the chair. Immediately step down to the floor with the same foot that started on the floor.
4. Continue as rapidly as possible until the final whistle. Avoid fatigue in the legs by changing feet occasionally, making the shift while both feet are on the chair.
5. The score is the total number of correct movements (up and down) performed in one minute.
6. It is permissible to stop and rest, but maximum effort is encouraged.

SIT-UPS (done on mats)

1. Assume a hook sitting position with feet flat on floor, back straight.
2. Place hands on the shoulders* with elbows reaching forward to rest on top of knees.
3. When feet are properly placed, a PARTNER will hold them in position.

4. Lie on back while waiting for the starting signal, keeping the hands on shoulders.
5. On signal, Ready Go, lift trunk far enough to touch the point of the elbows to the knees and return to back lying (BACK, BUT NOT HEAD TOUCHING MAT)
6. You may stop, rest, and restart if you wish. The score is the total number of correct movements (up and down) performed in ONE MINUTE.

*right hand on right shoulder, left hand on left shoulder.

Q-SORT STATEMENTS

BODY-IMAGE

1. I am good looking.
2. I enjoy having my picture taken.
3. I feel uneasy when I sit facing a group.
4. Heels make my legs look better.
5. I usually wear flat heeled shoes.
6. I am particular about the length of my skirts and dresses.
7. I am sophisticated.
8. People notice me when I enter a room.
9. I often notice people staring at me.
10. I enjoy looking at myself in the mirror.
11. Being well dressed is important to me.
12. I can appear sophisticated when I want to.
13. I dislike fat people.
14. I inherited my body build and therefore cannot do much about the way I look.
15. I enjoy being a girl.
16. I am concerned about the shape of my legs.
17. I get upset when my face breaks out.
18. I feel sorry for people who are homely.
19. My complexion has never been a problem.
20. Having a clear complexion is important to me.
21. I feel sorry for the girl who has a skin problem.
22. Physical activity is important to me.
23. My shoulders are broad.
24. I have good posture.
25. I feel most comfortable doing small restricted movements.
26. I am poised.
27. I am muscular.
28. I feel good in the clothes I wear.
29. I often wished I looked like someone else.
30. My physical appearance bothers me.
31. I often think about how I appear to others.
32. I look like an average person.
33. I wish I could wear the kind of clothes other girls wear.
34. I like to wear tight fitting clothes.
35. I wish I could do something about my size.
36. I am ashamed of my appearance.
37. I have big feet.
38. It is important for me to know I am physically attractive.
39. Weight control is difficult for me.
40. I think a lot about my physical appearance.

41. I am underweight.
42. I have nice teeth.
43. I have skinny arms.
44. I usually weigh more than I think I do.
45. I like to dress up because it gives me a good feeling.
46. My hair has always been a problem to me.
47. My hands are strong.
48. I have thick ankles.
49. I have expressive eyes.
50. My smile is warm and friendly.
51. I am sensitive about my size.
52. I am awkward.
53. I am well proportioned physically.
54. I spend a great deal of time on personal grooming.
55. Comments made in a group about physical appearance usually bother me.
56. I like to be told how I look.
57. I really don't care how I look.
58. I usually wear tight fitting sweaters.
59. I rarely think about my body.
60. I look good in shorts.
61. I feel fat.
62. I am too tall.
63. I have heavy thighs.
64. I look good in a bathing suit.
65. I like to talk about my appearance.
66. People are judged by their physical appearance.
67. I have ugly legs.
68. I have skinny legs.
69. My physical size makes me stand out.
70. I have big hips.
71. I like to learn about my body.
72. I am satisfied with the way I look.
73. I have small muscles.
74. I have big bones.
75. I am physically attractive.

Q-SORT STATEMENTS

SELF-CONCEPT

1. I express my emotions freely.
2. Most of my troubles are not my own fault.
3. I feel happy much of the time.
4. I feel secure within myself.
5. It's quite important for me to know how I seem to others.
6. I put on a false front.
7. I often feel that I want to give up trying to cope with the world.
8. I have confidence in myself.
9. I am kept going by hopes for the future.
10. I have courage - the willingness to keep trying.
11. I usually like people.
12. I am a strong, competent person.
13. I am full of life and good spirits.
14. I feel free and unhampered.
15. I can stand up for my rights if I need to.
16. My decisions are not my own. I feel controlled by others.
17. I am liked by most people who know me.
18. I am ashamed of myself.
19. I have some originality or inventiveness in me.
20. I don't remake myself to satisfy each person who is important to me.
21. I have initiative. I can get started on my own.
22. It takes everything I've got just to keep going.
23. If I can't have perfection, I don't want anything. Nothing in between will satisfy me.
24. I am shy.
25. Basically I like myself.
26. I am no one. I am not a person in my own right.
27. I am fearful, often dreading what may happen.
28. My energies and abilities are fully available to me.
29. I am intelligent.
30. I have a feeling I'm just not facing things.
31. I am different from others.
32. I forgive easily - don't hold grudges or try to "get even".
33. I tend to feel envy at other people's good fortune.
34. I have to protect myself with excuses, with rationalizing.
35. I am satisfied with myself.
36. I am worth being loved.
37. I shrink from facing a crisis or a real hard test of myself.
38. I understand myself.
39. I have a feeling of hopelessness.

40. I often feel resentful.
41. I feel helpless.
42. I am disorganized.
43. I am too much the result of past experiences to hope for much change.
44. I feel inferior.
45. I am a failure.
46. I am emotionally mature.
47. I am confused.
48. I am optimistic.
49. I am pretty sociable, and really enjoy being with people.
50. I get pleasure out of life.
51. I am critical of people.
52. I am superior to most other people.
53. I get upset when old and familiar things are changed.
54. I'm a pretty calm and relaxed person. Few things really bother me.
55. I generally am fortunate.
56. I am really self-centered - don't care much about other people.
57. It is pretty hard to really be myself.
58. I am usually an aloof, reserved person.
59. I do care for others and want them to be happy.
60. I am an angry, hostile person.
61. I live largely by other people's values and standards.
62. I really am disturbed - close to the breaking point.
63. I often feel guilty.
64. I trust my emotions.
65. I am kind and gentle.
66. I have warm emotional relationships with others.
67. I just have to drive myself to get things done.
68. I am a submissive person.
69. I feel able to make up my own mind and stick to it if I want to.
70. I am adaptable. A strange situation is not a crisis to me.
71. I just wish I could be someone else, and forget all about me.
72. I just can't tell anyone my real feelings.
73. I feel adequate.
74. I am a pretty stable person.
75. I am conscientious and honorable - can be depended upon.

Q-SORT STATEMENTS

MOVEMENT-CONCEPT

1. I am able to push a heavy object (like a piano) without difficulty.
2. My movements are described as slow.
3. Hanging by my arms is difficult for me.
4. I cannot keep up with the class when we do sit-ups.
5. Fine movements (like typing) are difficult for me.
6. Modern dance scares me.
7. I have difficulty getting my arms and legs to work together when I swim.
8. I like to move to music.
9. I take average size steps when I walk.
10. I have difficulty with balance when standing on one leg.
11. I doubt my ability to make baskets when playing basketball.
12. I feel discouraged about my physical ability.
13. I like to do stretching type exercises.
14. I try to get out of physical activity.
15. I have stiff joints.
16. Physical activity has always been important to me.
17. I feel hopeless when playing a game.
18. I am afraid to swim in deep water.
19. I fatigue easily.
20. I judge my physical performance by the best players in the class.
21. I can move as well as anyone.
22. I feel adequate when playing volleyball.
23. I really don't move well.
24. Sports scare me.
25. I feel confident about being able to learn new physical activities.
26. I feel embarrassed when doing exercises.
27. I am able to do heavy physical work.
28. I prefer doing things with my hands.
29. I like difficult physical tasks.
30. Jumping is no problem for me.
31. Physical fitness is unimportant to me.
32. I learn physical skills easily.
33. I throw a ball with accuracy.
34. I am able to meet the physical demands of everyday living.
35. I can be described as an energetic person.
36. I like to do big sweeping movements.
37. I usually use the handrail when going down the stairs.
38. I have difficulty climbing up a rope.
39. I stumble a lot when walking.
40. I have no difficulty carrying a wooden chair.

41. I like to do flowing kinds of movements.
42. I have difficulty with exercises which require me to move my arms and legs at the same time.
43. I like to swim.
44. I have fun playing on a team.
45. I like people who are active.
46. I make strong physical demands on myself.
47. I feel good when I move.
48. I am usually not able to do as well as others on the team.
49. I am physically fit.
50. I am easily discouraged when learning new movements.
51. I have difficulty catching large objects.
52. I can bounce a ball with ease.
53. I am interested in knowing how I perform physically.
54. I am really a good player.
55. I drop things.
56. I have trouble remembering dance steps.
57. I feel awkward when carrying large objects.
58. I perform best when doing small coordinated movements.
59. I like sports where I play against one other person.
60. I usually lose at sports.
61. I bowl with ease.
62. Controlling the ball in bowling is no problem for me.
63. I am a good swimmer.
64. I am afraid of falling.
65. My movements are inhibited.
66. I am average in physical skill.
67. I like to do hard physical work.
68. I like to be active.
69. I frequently bump into things.
70. My movements are brisk and sharp.
71. I have no difficulty keeping time with the music when I dance.
72. I feel helpless when faced with a physical task.
73. I have always been proud of my physical ability.
74. Physical activity bothers me. I would rather do something else.
75. I am well coordinated.

INSTRUCTION SHEET FOR Q-SORT
(Self-Sort)

1. You have 3 sets of statements with each set containing 75 statements.
2. You have 3 colored answer sheets each of which goes with a specific set of statements:

Sheet A of statements goes with Pink answer sheet A
Sheet B of statements goes with Blue answer sheet B
Sheet C of statements goes with Green answer sheet C

3. Begin with Sheet A set of statements and read each one. Then place the number of each statement in one of the blanks in the proper column on Answer Sheet A. There are nine columns, and each column can only have a certain number of statements in it (see the number above the column in parenthesis and circled in red). There are 75 blanks on the answer sheet.
4. Place the statements according to their proper value as you see it. Statements in each column have the same value regardless of their order.
5. Sort the statements from the point of view of how you see yourself at this exact moment in time, and not as you might ideally like to be.
6. Statements which are "Least Like" you will be placed in the columns to the left side of the answer sheet, and statements "MOST LIKE" you will be placed in the columns on the right.
7. Continue with Sheet B Set of Statements and Blue Answer Sheet B.
8. Continue with Sheet C Set of Statements and Green Answer Sheet C.
9. When you are finished, be certain your number is at the top of each answer sheet.
10. Bring all of your papers to the front table and leave them upside down on the proper pile.
11. Thank you very much for your help.

SUBJECT'S NUMBER _____

MOST LIKE ME

[illegible]

The left hand side of the scale (1 through 4) represents statements that are LEAST LIKE you; those in column 1 are not like you at all, those in column 2 may be like you but not very often, etc. Column 5 represents a neutral point. Columns 6 through 9 represent statements that are MOST LIKE you; those in column 6 are like you some of the time, those in column 7 are like you most of the time etc.

SCORING SHEET FOR Q-SORT
(Used by Investigator)

SELF-SORTIDEAL-SORT

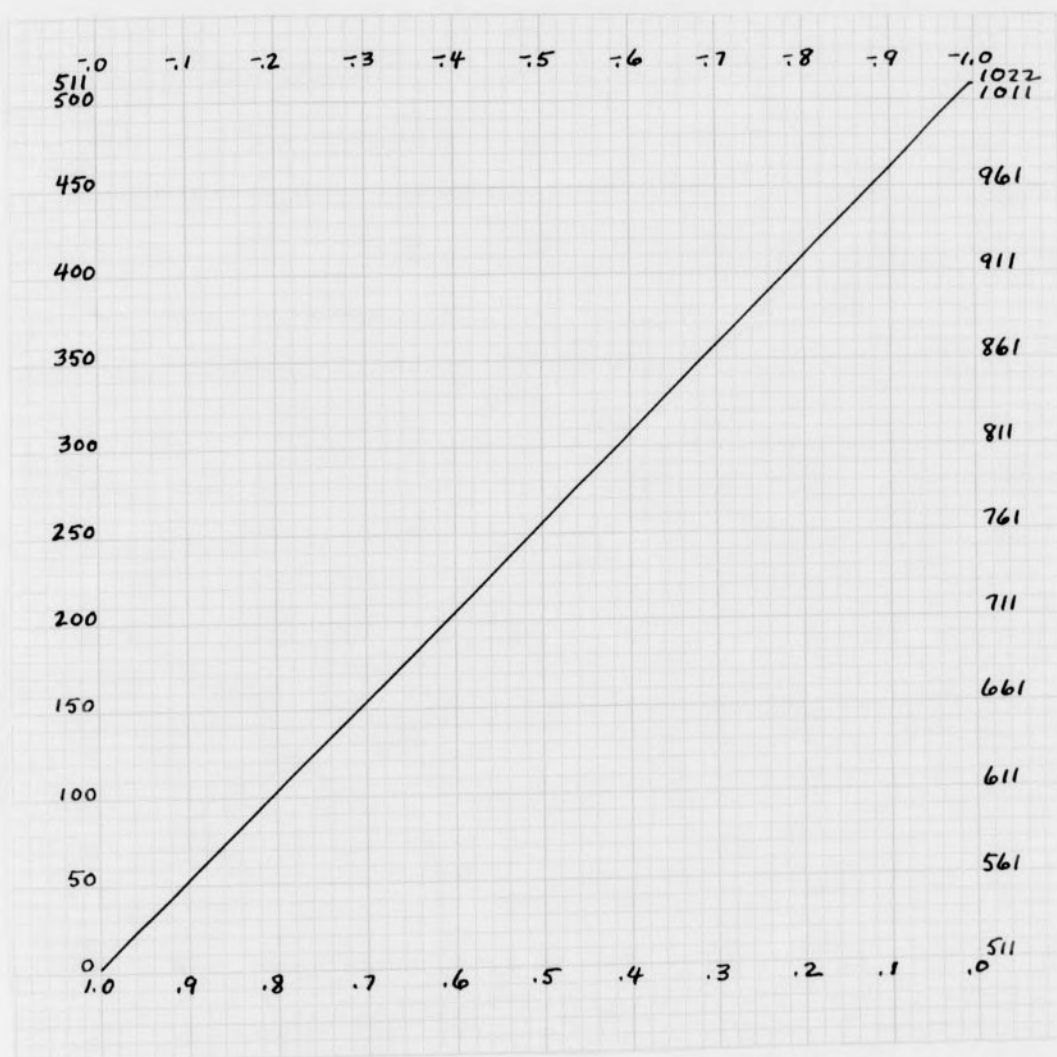
1-	41-	59-	1-	41-	59-
2-	42-	60-	2-	42-	60-
3-	43-	61-	3-	43-	61-
4-	44-	62-	4-	44-	62-
5-	45-	63-	5-	45-	63-
6-	46-	64-	6-	46-	64-
7-	47-	65-	7-	47-	65-
8-	48-	66-	8-	48-	66-
9-	49-	67-	9-	49-	67-
10-	50-	68-	10-	50-	68-
11-	51-	69-	11-	51-	69-
12-	52-	70-	12-	52-	70-
13-	53-	71-	13-	53-	71-
14-	54-	72-	14-	54-	72-
15-	55-	73-	15-	55-	73-
16-	56-	74-	16-	56-	74-
17-	57-	75-	17-	57-	75-
18-	58-		18-	58-	
19-			19-		

20- DIRECTIONS FOR USE:

21-
 22- The number of the column in
 23- which the statement appeared is
 24- written beside the statement num-
 25- ber. The difference between
 26- these numbers for the self-sort
 27- and ideal-sort is then found for
 28- each statement. This difference
 29- is squared and tallied in the lower
 30- right-hand side of this sheet.
 31- (Since there are only nine columns
 32- in which the Q-Sort statements are
 33- arranged, the numbers listed are
 34- the only possible squares of the
 35- differences). These squared dif-
 36- ferences are then added to find the
 37- total, which is entered on the no-
 38- mograph to determine the corre-
 39- lation coefficient.
 40-

0-
 1-
 4-
 9-
 16-
 25-
 36-
 49-
 64-

r =



NOMOGRAPH

XBX EXERCISE SERIES

This series of exercises was compiled by the Royal Canadian Air Force for the purpose of increasing and maintaining physical fitness. The series (as adapted) requires 11 minutes of actual activity to complete. (The adaptations are: bent knees and a choice of arm position on the sit-ups, plus bent knees and a time of one minute instead of two on the push-ups.)

- | | | |
|------------------------------|--------------------------------------|--|
| <p><u>EXERCISE ONE</u></p> | <p>Toe Touching
(1/2 minute)</p> | <p>Stand erect, feet about 16 inches apart, arms overhead. Bend down to touch floor outside left foot. Bob up and down to touch floor between feet. Bob again touching floor between feet once more. Bob and bend to touch floor outside right foot. Return to starting position.
Count = each return to starting position counts one.
(for FLEXIBILITY and WARM-UP)</p> |
| <p><u>EXERCISE TWO</u></p> | <p>Knee Raising
(1/2 Minute)</p> | <p>Stand erect, feet together, arms at sides. Raise left knee as high as possible, grasping knee and shin with hands. Pull leg against body, keeping back straight throughout. Lower foot to floor. Repeat with right leg. Continue by alternating legs - left then right.
Count = left and right knee raises count one.
(for FLEXIBILITY and WARM-UP)</p> |
| <p><u>EXERCISE THREE</u></p> | <p>Side Bending
(1/2 minute)</p> | <p>Stand erect, feet 12 inches apart, right arm extended overhead, bent at elbow. Keeping back straight, bend sideways from waist to left. Slide left hand down leg as far as possible, at the</p> |

same time press to left with right arm. Bob up a few inches and press to left again. Return to starting position and change arm positions. Repeat to right. Continue by alternating to left then right.

Count = bends to left and right count one.

(for FLEXIBILITY and WARM-UP)

EXERCISE FOUR

Arm Flinging
(1/2 minute)

Stand erect, feet 12 inches apart, upper arms extended sideways at shoulder level, elbows bent, outstretched fingers touching in front of chest. Press elbows backward and upward. Do not let elbows drop. Return arms to starting position and then fling hands and arms outward, backward, and upward as far as possible. Return to starting position.

Count = count one after each arm fling.

(for FLEXIBILITY and WARM-UP)

EXERCISE FIVE

Sit-Ups
(2 minutes)

Lie on back, legs bent and together, hands either behind head, across chest, or overhead. Move to sitting position. Keep feet on floor and back straight. Lower body to starting position.

Count = Each return to starting position counts one.

(ABDOMINAL STRENGTH)

EXERCISE SIX

Chest and Leg Raising
(1 minute)

Lie face down, legs straight and together, hands behind

head. Raise entire upper body and both legs from floor as high as possible. Keep legs straight. Return to starting position.

Count = each return to starting position counts one.

(for LONG MUSCLES OF BACK, BUTTOCKS, BACK OF THIGHS)

EXERCISE SEVEN Side Leg Raising
(1 minute)

With right side to floor, support weight on right hand (arm straight) and side of right foot, using left hand for assistance in balance if necessary. Raise leg until it is parallel with floor. Lower leg to starting position.

Count = each leg raise counts one. Do half number of counts raising left leg. Change to other side and do half number of counts raising right leg.

(for MUSCLES OF SIDES OF THIGHS)

EXERCISE EIGHT Push-Ups
(1 Minute)

Lie face down, knees bent, and hands directly under shoulders. Push up from hands and knees until arms are fully extended. Keep body and legs in a straight line. Return to touch nose to floor and repeat.

Count = each time nose touches floor count one.

(for SHOULDERS, ARMS ABDOMEN)

EXERCISE NINE

Leg-Overs
(1 minute)

Lie on back, legs straight and together, arms stretched side-wards at shoulder level, palms down. Raise both legs until they are perpendicular to floor, keeping them straight and together. Lower legs to left, trying to touch left hand with toes. Raise to perpendicular and lower to right side. Raise again to perpendicular and return to starting position.

Count = each return to starting position counts one.

(FLEXIBILITY OF WAIST
AREA AND STRENGTHENING
OF HIPS AND SIDES)

EXERCISE TEN

Run with Squat Jumps
(3 minutes)

Stand erect, feet together, arms at sides. Starting with left leg, run in place raising feet at least six inches from floor.

Count = each time left foot touches floor counts one. After each fifty counts do ten squat jumps.

Squat - crouch to touch floor with extended fingers, try to keep back straight, place one foot ahead of the other.

Jumps - jump to upright position with body straight and feet leaving floor. On landing reverse position of feet, return to crouch, and repeat.

Count = one for each jump.
(CONDITIONING OF HEART
AND LUNGS)